

Applicants : Zhongyi Li, et al.
Serial No. : 10/577,564
Filed : April 27, 2006
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Amendments to the Claims

Please amend the claims by replacing all prior listings of claims with the listing of claims below pursuant to 37 C.F.R. §1.121:

Listing of claims:

1. (Previously presented) Grain obtained from a rice plant, comprising (i) starch, (ii) an exogenous nucleic acid molecule comprising a sequence which is the same as, or fully complementary to, a nucleotide sequence of at least 50 contiguous nucleotides of the starch branching enzyme IIa (SBEIIa) gene coding region whose sequence is set forth in SEQ ID NO:2 which inhibits the expression of a rice SBEIIa gene, (iii) a reduced level of SBEIIa protein and, (iv) a reduced level of starch branching enzyme IIb (SBEIIb) protein in the rice grain, the reduced level of SBEIIa protein and of SBEIIb protein being relative to rice grain of an Indica variety, wherein the proportion of amylose in the starch of the grain is at least 40% as measured by an iodometric method.
2. (Previously presented) The grain of claim 1, further comprising a genetic variation selected from the group consisting of
 - a) a mutation of an *SBEIIb* gene which inhibits SBEIIb expression and/or activity, and
 - b) an introduced nucleic acid which inhibits SBEIIb expression and/or activity.

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3. (Canceled)
4. (Previously Presented) The grain of claim 1, wherein the proportion of amylose in the starch of the grain is at least 50%.
5. (Canceled)
6. (Previously presented) The grain of claim 1, wherein the exogenous nucleic acid molecule is an antisense, ribozyme or duplex RNA molecule.
7. (Canceled)
8. (Currently Amended) The grain of claim 2, ~~further comprising a reduced level of SBEI protein and/or activity~~ comprising a genetic variation selected from the group consisting of
 - a) a mutation of an SBEI gene which inhibits SBEI expression and/or activity, and
 - b) an introduced nucleic acid which inhibits SBEI expression and/or activity.
9. (Currently Amended) The grain of claim 1, ~~comprising an altered level of a protein and/or enzyme activity selected from the group consisting of ADP glucose pyrophosphorylase, GBSS, SSI, SSII, SSIII, a debranching enzyme of an isoamylase type and a debranching enzyme of a pullulanase type~~ comprising a genetic variation selected from the group consisting of

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- a) a mutation of a gene encoding ADP glucose pyrophosphorylase, GBSS, SSI, SSII, SSIII, a debranching enzyme of an isoamylase type, or a debranching enzyme of a pullulanase type, which alters, respectively, expression and/or activity of ADP glucose pyrophosphorylase, GBSS, SSI, SSII, SSIII, a debranching enzyme of an isoamylase type, or a debranching enzyme of a pullulanase type, and
- b) an introduced nucleic acid which alters expression and/or activity of ADP glucose pyrophosphorylase, GBSS, SSI, SSII, SSIII, a debranching enzyme of an isoamylase type, or a debranching enzyme of a pullulanase type.

- 10. (Original) The grain of claim 9, comprising an altered level of GBSS protein and/or enzyme activity.
- 11. (Previously Presented) The grain of claim 1 which is non-shrunken.
- 12. (Previously Presented) The grain of claim 1 which is brown rice grain having an average weight of at least about 25 mg.
- 13. (Previously Presented) The grain of claim 1 wherein at least 50% of starch granules within the grain appear non-birefringent when observed under polarized light.
- 14. (Previously Presented) The grain of claim 1 which has a starch content that is at least 90% of the starch content of equivalent, but unaltered, grain.

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15. (Withdrawn - Currently Amended) The grain of claim 2, ~~further~~ comprising a null mutation of the ~~SBEIIa~~ ~~or~~ *SBEIIb* gene.
16. (Withdrawn - Currently Amended) The grain of claim 1 which further comprises a *Wx^a* allele.
17. (Withdrawn - Previously Presented) A rice plant comprising i) an exogenous nucleic acid molecule comprising a sequence which is the same as, or fully complementary to, a nucleotide sequence of at least 50 contiguous nucleotides of the starch branching enzyme IIa (SBEIIa) gene coding region whose sequence is set forth in SEQ ID NO:2 which inhibits the expression of a rice SBEIIa gene, (ii) a reduced level of SBEIIa protein, (iii) a reduced level of starch branching enzyme IIb (SBEIIb) protein in the rice plant, the reduced level of SBEIIa protein and of SBEIIb protein being relative to rice plant of an Indica variety, and (iv) rice grain wherein the rice grain comprises starch, and wherein the proportion of amylose in the starch of the rice grain is at least 40% as measured by an iodometric method.
18. (Withdrawn - Previously Presented) Rice starch granules, comprising (i) starch, (ii) an exogenous nucleic acid molecule comprising a sequence which is the same as, or fully complementary to, a nucleotide sequence of at least 50 contiguous nucleotides of the starch branching enzyme IIa (SBEIIa) gene coding region whose sequence is set forth in SEQ ID NO:2 which inhibits the expression of a rice SBEIIa gene, (iii) a reduced level of SBEIIa protein

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and, (iv) a reduced level of starch branching enzyme IIb (SBEIIb) protein in the rice starch granules, the reduced level of SBEIIa protein and of SBEIIb protein being relative to rice starch granules of an Indica variety, wherein the proportion of amylose in the starch granules is at least 40% as measured by an iodometric method.

19. (Canceled)

20. (Withdrawn - Previously Presented) A product comprising rice starch granules, comprising (i) starch, (ii) an exogenous nucleic acid molecule comprising a sequence which is the same as, or fully complementary to, a nucleotide sequence of at least 50 contiguous nucleotides of the starch branching enzyme IIa (SBEIIa) gene coding region whose sequence is set forth in SEQ ID NO:2 which inhibits the expression of a rice SBEIIa gene, (iii) a reduced level of SBEIIa protein and, (iv) a reduced level of starch branching enzyme IIb (SBEIIb) protein in the rice starch granules, the reduced level of SBEIIa protein and of SBEIIb protein being relative to rice starch granules of an Indica variety, wherein the proportion of amylose in the starch granules is at least 40% as measured by an iodometric method.

21-23. (Canceled)

24. (Withdrawn - Previously Presented) A method of producing a rice plant capable of producing grain, the grain having starch comprising at least 40% amylose, comprising the steps of

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- a) introducing into a parent rice plant or seed an exogenous nucleic acid molecule comprising a sequence which is the same as, or fully complementary to, a nucleotide sequence of at least 50 contiguous nucleotides of the starch branching enzyme IIa (SBEIIa) gene coding region whose sequence is set forth in SEQ ID NO:2 which inhibits the expression of a rice SBEIIa gene; and
- b) identifying a progeny plant of the parent rice plant or seed, wherein the starch of grain of the progeny plant comprises at least 40% amylose as measured by an iodometric method.

25-42. (Canceled)

43. (Previously Presented) An isolated nucleic acid molecule comprising a sequence which is the same as, or fully complementary to, a nucleotide sequence of at least 50 contiguous nucleotides set forth in SEQ ID NO:2 which, which encodes an inhibitor of rice SBEIIa and an inhibitor of rice SBEIIb, which may be the same or different.

44-47. (Canceled)

48. (Previously Presented) The rice grain of claim 1 which is milled, ground, kibbled, cracked, rolled, boiled, or whole grain.

49. (Previously Presented) A composition comprising the rice grain of claim 1 and a food ingredient or water.

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50-52. (Canceled)

53. (Previously Presented) A process for making a food product comprising,

- a) processing the rice grain of claim 1 so as to make flour, brokers, rice bran or oil, and
- b) including the flour, brokers, rice bran or oil in the food product.

54. (Previously Presented) A process for making a food product comprising,

- a) milling the rice grain of claim 1,
- b) separating starch from the milled material of step a), and
- c) processing the starch separated in step b) to make the food product.

55. (Previously Presented) The rice grain of claim 1 which is of an Indica variety.